Seattle
Auxiliary Communications Services
(ACS)

COMMUNICATIONS ACADEMY

Practical digital messaging

April 15, 2012

Presented by Jeff Coleman radiobug@hotmail.com

Seattle Washington USA
W7 EIR

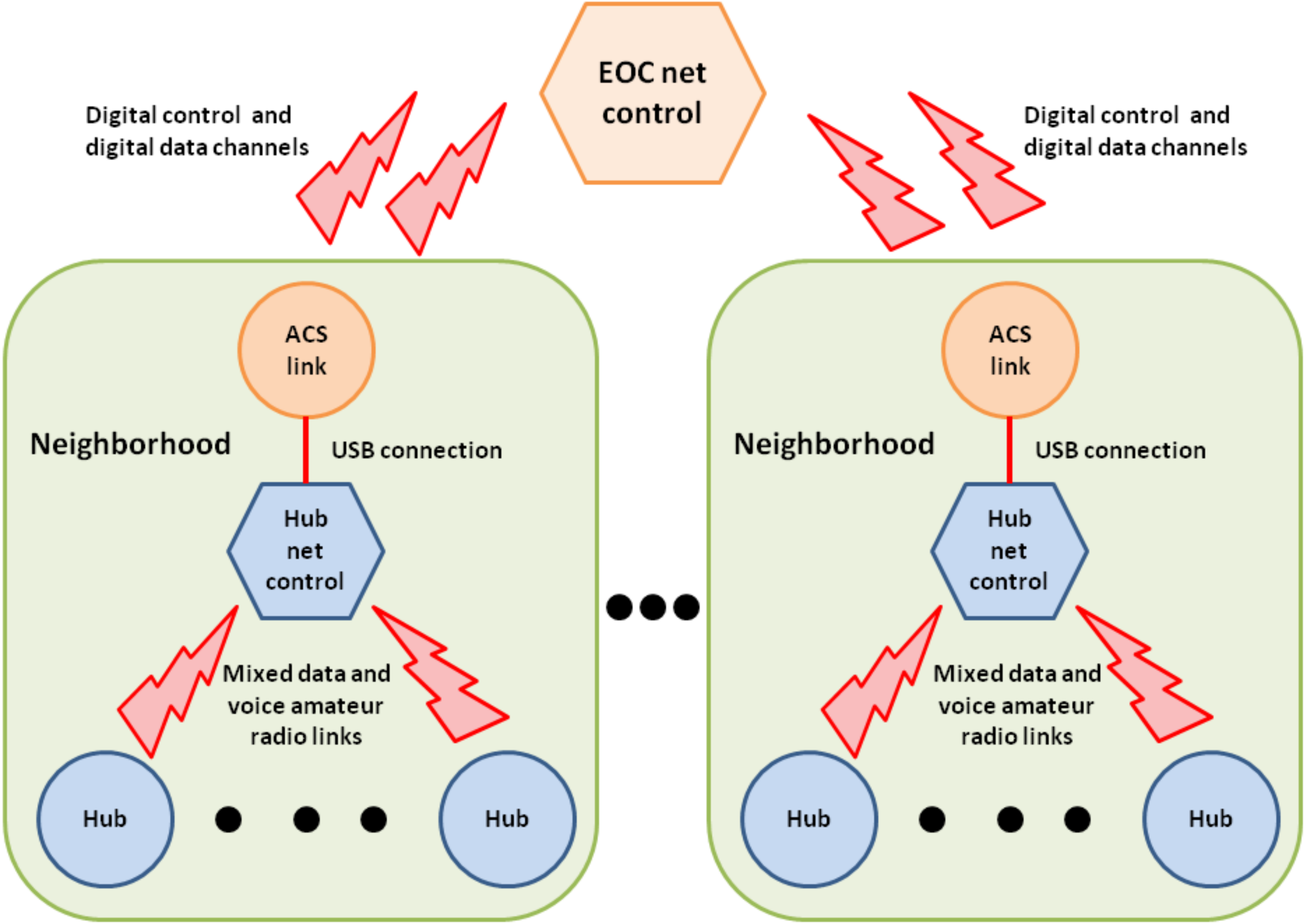
Today's objective: To become fluent with fldigi/ flmsg digital messaging tools and procedures for communications between hub sites and the EOC

➢Learn procedures successfully used for digital messaging by Capitol Hill hubs during the Winds of Winter exercise on October 29, 2011

➢Train in anticipation of the acceptance the ACS draft proposal to align ACS community service with the local hub structure and provide comm support within the local hubs where desired and between the hubs and the EOC

➢Develop skills transferrable to ACS, MST, and other emcomm providers

First, let's recall the current hub voice message handling procedures by watching a short video produced by Queen Anne Eagle Scout hub volunteers.


EOC net control
Digital control and digital data channels
Digital control and digital data channels
ACS link
Neighborhood
USB connection
Hub net control
Mixed data and voice amateur radio links
Hub
Hub
ACS link
Neighborhood
USB connection
Hub net control
Mixed data and voice amateur radio links
Hub
Hub

Digital messaging workflow

1. Hub radio operators enter the emergency message into the digital radio app on their netbook.

2. Hub radio operators use their netbook speaker and radio mike to transmit the message using digital audio over ham radio to hub net control.

3. Hub net control uses her radio speaker and netbook mike to input the digital audio to the digital radio app on her netbook.

4. Hub net control moves the received message from her netbook to the digital radio app on the ACS link laptop via USB.

5. The ACS link operator uses his laptop speaker and radio mike to transmit the message using digital audio over ham radio to EOC net control, where the ACS digital operator enters it into their database for further action.

Why digital messaging for emcomm?

Substantially reduced labor and time for high accuracy message transmission between hubs & EOC:

➢ACS message data entered into digital app once at the hub site; Eliminates 2nd transcription of message data at hub net control for hand off to ACS link operator

➢Speedier digital message transmission between hub and hub net control and again to the EOC replaces two voice transmissions

➢Likelihood of error, already small, becomes nil due to flmsg checksums on message content.

For example, would you rather send this message by voice or digitally:

The following request for medications has been received from the Delridge Shelter in West Seattle. The request is immediate and they have declared their situation as an emergency. Please provide the following:

120 capsules -200mg Carbamazepine,

40 capsules -250mg Divalproex Sodium,

80 capsules -25mg Desvenlafaxine,

80 capsules -10mg Tranylcypromine,

40 capsules - 10mg Escitalopram

They believe that request will see them through the next 72 hours. They understand that West Seattle is physically isolated. They propose sending a runner to meet a boat at the north end of the debris field at the former location of the West Seattle Spokane Street Bridge. The runner will have APRS on 144.390 simplex and will IDENT as "WSEA-Run". The station can send and receive APRS 1-Line messages in the field and will be in contact with the Delridge Shelter on

The cost of saving that labor and time is:

- ➢A laptop at each participating hub
- ➢A laptop at hub net control
- ➢A laptop at the ACS link position
- ➢The power needed to run the laptops
- ➢The USB cabling needed between the hub net control and ACS link position laptops, or alternatively, USB flash drives
- ➢Training required in the digital message applications and procedures
- ➢A dedicated citywide channel for ACS digital data traffic, referred to as the *digital data channel*
- ➢A dedicated citywide voice channel for coordinating traffic on the digital data channel, referred to as the *digital control channel*

MEOW
NASA
CERT
acer
HUB site organization and Information Flow
Emergency Operations Center (EOC)
Message Manager
Greeter
Community Members ("reporters")
CHIPP
I HAVE:

A conservative digital emergency messaging protocol

- Employs the standard message handling workflow developed for our drills
- Digital traffic between hub and hub net control carried on the same channels as traditional voice message traffic
- No additional channels or radios needed for the neighborhood hub sub-networks
- As in standard voice message handling workflow, digital ACS messages from hubs are funneled in priority order through hub net control
- ACS link operator quality checks and transmits messages to the EOC in priority order

Hardware requirements

- Each participating hub, hub net control, and ACS link position requires the following hardware:
  - A laptop with microphone and speaker
  - An amateur radio transceiver (referred to here as HT)
  - A second HT is required at the ACS link position
- A USB connection is required between the co-located hub net control and ACS link laptops, e.g. Radio Shack Gigaware USB Transfer Cable 2601713
- Alternatively, a USB flash drive could be used to transfer ACS message files between the hub net control laptop and the ACS link laptop

Software requirements

Each laptop must be loaded with the latest versions of the fldigi, flwrap, and flmsg applications, available from the following website:
http://www.w1hkj.com/download.html

License requirements

- Each hub and hub net control must have a licensed radio amateur present as the control operator
- As before, the ACS link operator is a licensed radio amateur

Message numbering

Capture field and EOC message numbers in digital message file name

Field message number – hub network number

- As the ACS digital message is created, the hub message handler names it with its field message number
- The field number consists of
  - A two letter neighborhood prefix,
  - A two letter hub prefix, and
  - A four digit serial number.

For example, Capitol Hill neighborhood prefix is **CH**. The hub prefixes are:

- **CA** – Cal Anderson hub. Field message numbers begin with **CHCA**
- **MP** – Miller Park hub. Field message numbers begin with **CHMP**
- **VP** – Volunteer Park hub. Field message numbers begin with **CHVP**

EOC message number

After the ACS link operator transmits the digital message to ACS net control and gets his EOC number:

➢The ACS link operator prepends the string “EOC” and the EOC message number onto the digital message file name (that is, onto the field message number of the digital message)

Example:

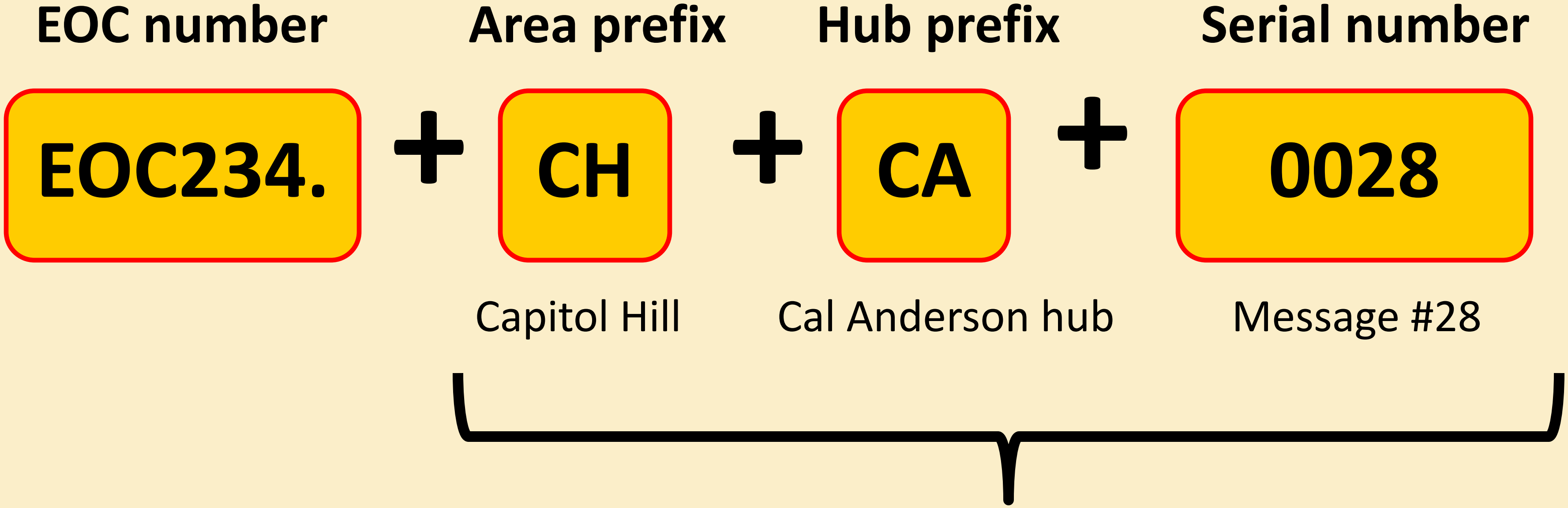
➢Capitol Hill ACS link operator sends digital message named CHCA0028.p2s to ACS net control

➢Its EOC message number is 234,

➢Capitol Hill ACS link operator renames CHCA0028.p2s as EOC234.CHCA0028.p2s

This naming convention correlates EOC number with neighborhood field message number

The parts of digital message file name
EOC234.CHCA0028



EOC number

EOC234.

+

Area prefix

CH

Capitol Hill

+

Hub prefix

CA

Cal Anderson hub

+

Serial number

0028

Message #28

Field message number from hub

Prepare your laptop for digital messaging

Begin by downloading the fldigi suite of applications to your laptop from one of the USB keys provided. Install fldigi, flwrap, and flmsg.

You can also load the latest versions of the fldigi, flwrap, and flmsg applications, available from the following website:
http://www.w1hkj.com/download.html

We'll step you through the essential installation steps. Detailed installation instructions are available from the following website:
http://www.panbems.org/

Install fldigi

When you run the fldigi setup, the Fldigi configuration wizard guides you through initial configuration of fldigi. Provide your input on the following *Fldigi configuration wizard* pages:

Operator information

1. In the **Callsign:** field, enter your callsign.
2. In the **Name:** field, enter your name.
3. In the **QTH:** field, enter your city and state.
4. In the **Locator:** field, enter your Maidenhead grid square (probably CN87).
5. In the **Antenna:** field, enter your antenna.
6. Click the **Next** button.

Note: This data can also be entered from the main *fldigi* window, by clicking **Configure** on the fldigi menu bar and selecting **Operator** from the drop down menu.

Install fldigi (continued)

Audio devices

1. Check **PortAudio**.
2. In the **Capture:** and **Playback:** drop down menus, select the laptop's microphone and speakers, respectively.
3. Click the **Next** button.

Note 1: If you are using an audio interface device like the SignaLink, in the **Capture:** and **Playback:** drop down menus select the USB Audio CODEC choices for the soundcard in the interface device.

Note 2: This data can also be entered from the main *fldigi* window, by clicking **Configure** on the fldigi menu bar and selecting **Sound Card** from the drop down menu.

Select to transmit and receive Reed-Solomon identification

1. Start fldigi. The main *fldigi* window opens.
2. On the main *fldigi* window, check the two boxes in the upper right corner labeled **RXID** and **TXID**. A green light appears in each when they are selected.

Select the MT63-2000 mode

1. On the fldigi menu bar, click **Op Mode.** In the drop down menu, select **MT-63**. In the next drop down menu, select **MT63-2000**.
2. On the *fldigi* menu bar click **Configure**, and on the drop down select **Modems**. The *Fldigi configuration* window opens to the *Modems* tab.
3. Select the *MT-63* subtab.
4. Uncheck the **Allow manual tuning** box.
5. Click the **Close** button. The *Fldigi configuration* window closes.

Identify the laptop’s microphone and speaker devices

If you performed the procedure in ***Install fldigi*** above, skip this section and wait for ***Configure video identification***.

1. On the *fldigi* menu bar click **Configure**, and on the drop down click **Sound Card**. The *Fldigi configuration* window opens to the *Audio* tab and the *Devices* subtab.
2. Check **Port audio**, then in the **Capture** and **Playback** drop down menus select the laptop's microphone and speakers, respectively.
3. Click the **Save** button, then click the **Close** button. The *Fldigi configuration* window closes.

Configure video identification, Reed-Solomon identification, and pre-signal tone

1. On the fldigi menu bar click **Configure**, and on the drop down click **IDs**. The *Fldigi configuration* window opens to the *Id* tab.
2. In the top section (*Video Preamble ID*):
   a) Check **Transmit video text**.
   b) Uncheck **Use small font**.
   c) In the field next to **Transmit Video text:**, enter your call sign.
   d) In **Chars/Row**, use the slider to set the numerical value to the number of characters in your call sign.
   e) Uncheck **500 Hz limit**.
   f) Check **Mode width limit**.

Configure video identification, Reed-Solomon identification, and pre-signal tone (continued)

3. In the lower left section (*Reed-Solomon ID Rx*):
   a) Check **Detector searches entire passband**.
   b) Check **Mark previous frequency and mode**.
   c) In the lower right section (*Pre-Signal Tone*), use the arrows to set the value to 2.0 seconds.
4. Click the **Save** button, then click the **Close** button. The *Fldigi configuration* window closes.

Enable opening flmsg automatically

1. On the *fldigi* menu bar click **Configure**, and on the drop down click **Misc**. The *Fldigi configuration* window opens to the *Misc* tab and the *CPU* subtab.
2. Click the **NBEMS** subtab. In the top section (*NBEMS data file interface*) check **Enable**.
3. In the bottom section (*Reception of flmsg file*) check **Open with flmsg**, then click the **Locate** button. A *Locate flmsg executable* window opens.
4. Navigate to the folder containing the flmsg executable.

   On Windows –The `flmsg.exe` executable is found here:

   `C:/Program Files/flmsg{version number}`
   On **OS X/Mac** –
   1. a) Navigate to the flmsg{version number} application.
   2. b) Press and hold the **Control** key and select **flmsg {version number}**.
   3. c) From the menu, select *Show package contents*.
   4. d) Navigate to `/Contents/MacOS/flmsg`.
   5. e) Populate the **Flmsg:** field with the flmsg executable.
5. **On Windows** – Select the executable, then click the **Open** button.

   On OS X/Mac – Drag the flmsg application to the **Flmsg:** field.
6. The **Flmsg:** field is populated with the path to the flmsg executable.
7. Click the **Save** button, then click the **Close** button. The *Fldigi configuration* window closes.

Put the ACS message form template in the fldigi templates folder

On the hub laptops, place the ACS message form template `SEA.ACS.msg.form.template.p2t` in the following folder:

- **On Windows** – `C:/Users/{username}/NBEMS.files/ICS/templates`
- **On OS X/Mac** – `/Users/{username}/.nbems/ICS/templates`

NOTE: The final block in the `SEA.ACS.msg.form.template.p2t` template file must contain your two letter neighborhood prefix. For example, the Capitol Hill prefix is CH.

Create the sent folder

1. Start flmsg.
2. On the *FLMSG* menu bar, click **File**. In the drop down menu, select **Open**. An *Open data file* window opens in the messages folder.
3. On the *Open data file* menu bar, click **New folder**. A new folder is created in the messages folder with the cursor in the name field.
4. Enter the new folder name `sent`. Press the **Enter** key. The new folder is renamed `sent`.
5. Close the *Open data file* window and the *FLMSG* window.

Digital message handling procedures

- ➢Sending an flmsg from a hub to hub net control
- ➢Receiving the flmsg from a hub
- ➢Transferring the flmsg from hub net control to the ACS link operator using a USB flash drive
- ➢Sending the flmsg to EOC net control
- ➢Recording the EOC number for a transmitted flmsg

Sending an flmsg from a hub to hub net control

1. Start flmsg.
2. On the *FLMSG* menu bar, click **Template**. In the drop down menu, select **Load**. An *Open template file* window opens in the flmsg `templates` folder.
3. Select the ACS message template named `SEA.ACS.msg.form.template.p2t`. Click **Open**. The flmsg form is populated with the ACS message blocks.
4. Enter the emergency message data into the appropriate ACS message blocks.
5. In the **Subject** field, enter the message priority based on the severity of the reported emergency, as defined by ACS standards.
6. Click the **...** buttons to the right of the **Date** and **Time** fields to populate those fields.
7. On the *FLMSG* menu bar, click **File**. In the drop down menu select **Wrap**. In the next drop menu, select **Autosend**. The *Save data file* window opens.

Sending an flmsg from a hub to hub net control

8. In the **File name** field, clear the provided file name but leave the .p2s file extension in place. Enter the field message number in front of the .p2s file extension.
9. Contact hub net control and announce that you have a priority ___ message to send using flmsg.
10. When you are instructed to transmit, hold the HT microphone within range of the laptop speakers and press the push to talk button.
11. Click **Save** on the *Save data file* window. The data transmission begins.
12. When the data transmission finishes, announce the control operator’s call sign and end transmission.
13. On the *FLMSG* menu bar, click **File**. In the drop down menu, select **Open**. The *Open data file* window opens in the `messages` folder.
14. Select the flmsg file just transmitted and drag it to the `sent` folder.
15. Close the *Open data file* window and the *FLMSG* window.

DAVIDSON
LITHION 2

Receiving the flmsg from a hub

1. After giving the hub permission to transmit the ACS message flmsg, place the speaker of the HT within range of the microphone of the laptop. When the hub flmsg transmission has completed, an *FLMSG* window opens on the laptop display.
2. On the *FLMSG* menu bar, click **File**. In the drop down menu , select **Save**. The flmsg is saved to the `messages` folder with the field message number assigned by the hub operator as its name.
3. Close the *FLMSG* window.

Transferring the flmsg using a USB flash drive

Procedure for hub net control operator:

1. After receiving and saving the ACS message flmsg from the hub, insert a USB fash drive into a USB socket on the laptop.
2. Start flmsg.
3. On the FLMSG menu bar, click **File**. In the drop down menu, select **Open**. The *Open data file* window opens in the `messages` folder.
4. Drag the received flmsg to the **Removable Disk** icon in the folder pane on the left side of the *Open data file* window.
5. Right click on the **Removable Disk** icon.
6. From the drop down menu, select **Eject**. The **Removable Disk** icon disappears.
7. Remove the USB flash drive from the laptop.
8. Inform the co-located ACS link operator that an ACS message is ready for relay to the EOC and transfer the USB flash drive.
9. In the *Open data file* window, select the flmsg file just transferred and drag it to the `sent` folder.
10. Close the *Open data file* window and the *FLMSG* window.

Transferring the flmsg using a USB flash drive

Procedure for ACS link operator:

1. After receiving the USB flash drive containing the ACS message flmsg from the hub net control, insert it into a USB socket on the laptop.
2. On Windows, start Explorer. On OS X/Mac start Finder.
3. Double click the **Removable Disk** icon. The contents of the USB flash drive are displayed.
4. Start flmsg.
5. On the *FLMSG* menu bar, click **File**. In the drop down menu, select **Open**. The *Open data file* window opens in the `messages` folder.
6. Drag the received flmsg from the **Removable Disk** folder in the Explorer/Finder window to the *Open data file* window. The received flmsg appears in the `messages` folder in the *Open data file* window.
7. Close the *Open data file* window and the *FLMSG* window.

Sending the flmsg to EOC net control

1. When an flmsg is ready for relay to the EOC, start flmsg.
2. On the *FLMSG* menu bar, click **File**. In the drop down menu, select **Open**. The *Open data file* window opens in the `messages` folder.
3. Select the new ACS message flmsg file just transferred from the hub net control laptop. It will be an flmsg file in the `messages` folder without an EOC number prefix.
4. Click **Open**. The flmsg form is populated with the contents of the ACS message flmsg, including the message priority in the **Subject** field.
5. Perform a quality control check on the contents of the ACS message flmsg.
6. Contact EOC net control on the digital control channel and announce that you have a priority ___ message to send using flmsg.

Sending the flmsg to EOC net control

7. When you are instructed to transmit, place the HT on the digital data channel, hold the HT microphone within range of the laptop speakers and press the push to talk button.
8. On the *FLMSG* menu bar click **File**. In the drop down menu select **Wrap**. In the next drop menu, select **Autosend**. The data transmission begins.
9. When the data transmission finishes, announce your call sign and end transmission.
10. On the *FLMSG* menu bar, click **File**. In the drop down menu, select **Open**. The *Open data file* window opens in the `messages` folder.
11. Select the file just transmitted and drag it to the `sent` folder.
12. Close the *Open data file* window and the *FLMSG* window.
13. Return the HT to the digital control channel.

Recording the EOC number for a transmitted flmsg

1. When EOC net control returns with your EOC message number for a transmitted ACS message, start flmsg.
2. On the *FLMSG* menu bar, click **File**. In the drop down menu, select **Open**. An *Open data file* window opens in the `messages` folder.
3. Double click on the `sent` folder. The transmitted ACS message flmsg files with their .p2s file extension are displayed.
4. In the *Open data file* window, right click the flmsg file whose field number corresponds to the EOC message number, then in the drop down menu click **Rename**.
5. Rename the flmsg file corresponding to the EOC message number by prepending the string “EOC” and the EOC number to the file name of that flmsg. For example, if you transmitted flmsg CHCA0028.p2s to ACS net control and its EOC message number is 234, then rename CHCA0028.p2s as EOC234.CHCA0028.p2s.
6. Close the *Open data file* window and the *FLMSG* window.

Now you’re expert digital emcomm operators!

Stay in practice:

The Puget Sound Digital Hams Net
Every Monday evening at 8 PM (after PSRG net)
WW7SEA repeater
444.550 MHz (+offset) with a PL of 141.3 Hz.

See you on the waterfall!